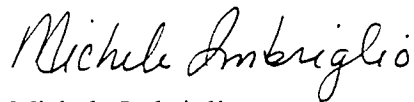


4/11/01

Dear RAB Members:

Enclosed please find a copy of the minutes of the March 21, 2001, RAB meeting.
If you have any questions or concerns please contact me at (401)841-7714.

Very truly yours,



Michele Imbriglio
RAB Secretary

Copy to: (w/enc)

Dr. D.K. Abbass

Ms. Barbara Barrow, Esq.

Mr. John R. Bernardo, III, Esq.

Ms. Mary A. Blake

Dr. David W. Brown

Mr. Richard D. Coogan

Mr. Paul A. Cormier

Mr. Thurston Gray

Mr. Byron Hall

Ms. Susan Hester

Mr. Eugene Love

Ms. Elizabeth Mathinos

Mr. Manuel Marques

Mr. Thomas McGrath

Mr. Ed Moitoza

Mr. James E. Myers

Mr. Howard L. Porter

Mr. Emmet E. Turley

Mr. John Vitkevich

Ms. Claudette Weissinger

Ms. Mary Philcox

Mr. David Egan

Mr. Paul Kulpa, RIDEM

Ms. Kymberlee Keckler, EPA

CAPT R. A. Cooper, NAVSTA

CDR R. L. Freitag, NAVSTA

CAPT Jon Wyman, Retired
Hon. Paul W. Crowley
Hon. June Gibbs
Mr. Joseph McEnness
Mr. Paul Russell
Mr. John Torgan
Mr. Jim Shafer
ATSDR
Mr. Gregg Tracey, SAIC
Councilman Dennis McCoy
Dr. David Kim
Mr. Brian Bishop
Brother Joseph
Newport Public Library
Middletown Free Library
Portsmouth Free Public Library
Mr. Bob Jones, Groton
Mr. David Sanders, NAVSTA
Mr. David Dorocz, NAVSTA
Ms. Melissa Griffin, NAVSTA
Ms. Shannon Behr, NAVSTA
Mr. Rick Machado, NUWC
Ms. Sarah White, EPA
Ms. Jennifer Stump, Gannett Fleming
Mr. Tim Prior, USF&WS
Mr. Ken Finkelstein, NOAA
Ms. Diane Baxter, TtNUS, Wilmington
Mr. Matt Weaver, Green Light Foundation
Dr. Robert Quigley
Mr. Robert Gilstein
Ms. Amrita Roy
Ms. Virginia Lee
Ms. Arlene Kalewski
Ms. Kelly Woodward

**NAVAL STATION NEWPORT
RESTORATION ADVISORY BOARD MEETING
March 21, 2001**

MINUTES

On Wednesday, March 21, 2001, the NAVSTA Newport Restoration Advisory Board (RAB) gathered at the Officer's Club for its monthly meeting. The meeting began at 7:10pm and ended at 8:30pm.

In attendance were Claudette Weissinger, Kathy Abbass, David Brown, Manuel Marques, Dave Egan, James Myers, Emmet Turley, Greg Kohlweiss NAVSTA PAO, John Vitkevich, Kymberlee Keckler USEPA, Paul Kulpa RIDEM, Thurston Gray, Eugene Love, Capt. R. A. Cooper NAVSTA, Melissa Griffin NAVSTA, Shannon Behr NAVSTA, David Dorocz NAVSTA.

MEETING MINUTES

February meeting minutes were approved with the addition of the attachment provided by Kathy Abbass. See Enclosure (1).

ACTIVITY UPDATE-Melissa Griffin

Melissa Griffin advised that Jim Shafer was unable to attend the February meeting in person, however he did provide updated slides, which are provided as Enclosure (2). There were no questions on any of the sites.

McALLISTER POINT DREDGING PROJECT CHRONOLOGY-David Dorocz

Dave Dorocz presented a chronology of past presentations made before the RAB relative to the McAllister Point Dredging Project.

Why is the Navy doing this project? The Navy is doing this project because the USEPA and the State of Rhode Island require it. The Navy has a Federal Facility Agreement (FFA) with both organizations. If the Navy does not meet established deadlines and criteria we [Navy] are subject to enforcement actions.

An open house was presented on June 24, 1999, which presented the Proposed Remedial Action Plan for the cleanup. The open house was a new format, there was a video that explained the project and there were various stations. This was open to the public. The community and other interested parties were welcome to comment. The notice of the availability of the

Proposed Plan, the start of the 30-day public comment period and the date of the open house were posted in the Providence Journal Bulletin and the Newport Daily News. Six community members attended the open house. One comment was received from a RAB member, two comments were received from the TAG, one comment was received from Coastal Resource Management Council, which was also the same as one comment from the TAG, and there was one comment from a community member.

The comment from the community member reads as follows; "I just feel it has been a big problem for a very long time and I feel something should be done and I don't know what. I am not knowledgeable to make that decision but I really do."

As far as community outreach, monthly RAB meetings are held 11 times a year, RAB meeting notices are published in the Newport Daily News and are open to the public and five presentations were made during those RAB meetings relative to the McAllister Point project.

Before the Public Hearing the RAB was briefed on the Proposed Plan, the open house format was discussed in detail. There were presentations on the PreDesign Data, Offshore Dredging, Habitat Survey and Mitigation Plan. At the 85% design meeting there were 4 RAB members that attended. Out of that meeting 17-25 questions were asked and responded to. The September 2000 RAB quarterly featured an article on the McAllister Point Dredging Project and was distributed to over 600 interested parties.

The Navy will obviously continue to brief the RAB in advance to prepare you for community outreach. The RAB will continue to advise the Navy and provide input. Hopefully the next time we get to a formal public hearing process, all the community concerns have been addressed. With only 6 comments received on the McAllister Point Dredging project, future focus should be for the RAB membership to take a more active role in getting people to be interested and participate in the public comment periods of upcoming projects. The next three upcoming and biggest projects on the horizon include Derecktor Shipyard-Offshore, Old Fire Fighter Training Area (OFFTA)-Offshore and Tank Farm #5. If we want to maximize public comment at that point we need to shift RAB focus to these projects and start working towards that end now.

Dredging is a controversial issue, but since the projects that are coming up may likely involve dredging at Derecktor Shipyard and OFFTA I [Dave Dorocz] think the RAB members need to better understand the requirement to do this work. I ask that

EPA try to put something together to better explain it to the membership so that they understand the necessity to do the dredging. Kymberlee Keckler USEPA wanted to clarify that the EPA does not require dredging, they require remediation when there is an unacceptable risk to human health or the environment. A range of options has to be evaluated in the feasibility study phase of a project. Kymberlee feels it is somewhat premature to say that OFFTA requires dredging when it has not gone through the feasibility study. There has been a feasibility study completed at Derecktor, which looked only at dredging remedies so it is likely dredging will be the remedy there. Dave didn't mean to imply dredging would be the remedy but most likely would be one option that is looked at and he feels it is important for the membership to fully understand the requirement and how we end up with that remedial action if that is going to be the remedial action.

Emmet Turley commented on community outreach-he has found that while the minutes and newsletter are being sent to the Town Clerk in Jamestown for distribution they are not being distributed. He is going to investigate.

Eugene Love felt it would be important to see the mailing list to provide input to the list. A mailing list was provided to him at the meeting, he will review it and advise if there are to be any new additions made to the list. The discussion on the mailing list will continue at the April meeting.

COMMITTEE REPORTS FROM COMMUNITY MEMBERS

Project Committee-Emmet Turley Committee Chair: Emmet has two additional articles on the effects of dredging. See Enclosure (3).

Planning Committee-Tom McGrath Committee Chair: New binders are available for those members who did not get one yet. Tom asked for a Navy representative to give a presentation to explain the law suit, i.e. what would happen if a suit were filed, where would the award go, that RIDEM will be filing relative to McAllister Point Offshore area. There was discussion about the filing of a claim and whether or not the state will actually file a claim. Paul Kulpa stated that they would file a claim because it is Navy policy that a claim will be filed. It is premature to discuss what would be done with an award because 1) a claim has not been filed and 2) there has been no award made. Kymberlee Keckler, USEPA suggested, as discussed at previous meetings, that a list be compiled of projects the community would like to see completed, if and when an award was received. Tom McGrath decided that this issue would be tabled

until a claim is filed and then ask for a presentation at that time.

Membership Committee-Howard Porter Committee Chair: No report, as committee chair was not present at the meeting.

Public Information-Claudette Weissinger Committee Chair: Newsletter was completed and distributed. Claudette feels delay in the newsletter is due to poor communication. Suggestions were solicited for the next newsletter. The topic of the next newsletter will be on the Old Fire Fighter Training Area (OFFTA).

NEW BUSINESS

RAB Charter and Mission Statement-minor "housekeeping" changes were made to the charter. Naval Education Training Center (NETC) was changed to Naval Station (NAVSTA) Newport. NORTHDIV was changed to Northern Division. The sentence "Notification of RAB meetings will be mailed to RAB members at least 72 hours prior to the date set for the meeting" and replace that with "Notification of RAB meetings will appear in the Newport Daily News". There was discussion about putting the announcement in the Providence Journal as well as the Newport Daily News. It was advised that there are several issues of the Providence Journal. It was also advised that it would be very costly to run the notice in the Providence Journal.

Kymberlee Keckler USEPA wanted to discuss the amendment to add the participation of tribal governments in the RAB at Newport. Kymberlee provided an example of the charter of Loring Air Force Base. (This is not provided as an enclosure. Please contact the RAB Secretary at 841-7714 if would like a copy.) Discussion continued regarding the addition of tribal governments to the RAB at Newport. It is felt that tribal governments could apply now as the charter is written without an amendment to add them specifically.

Kathy Abbass would like to have the State agency come in to talk about the inter-relationship between Native Americans and Federal Agencies.

Final decision was made that discussion on this issue will be tabled until that time that a tribal government applies for membership.

RAB Budget-Dave Dorocz mentioned that someone had concern with the RAB Budget report because they didn't understand the breakdown. The breakdown appears in the March meeting minutes.

Kathy Abbass cited RAB support services are \$15,000.00. She cited meeting minutes from February 1999 that the RAB was hiring a half time secretary for \$14,000.00/yr at 20 hr/wk. She understands is not quite the way it has worked out. \$15,000.00 for RAB support services, \$10,000.00 for RAB Newsletters and RAB meeting notices \$660.00/notice or \$7,200.00 which leaves about \$2,700.00 for all other expenses of the RAB. These numbers do not include room rental and refreshments. Kathy Abbass questions the amount of time the RAB secretary works for the RAB and whether or not she is actually half time or quarter time. The minutes from February 1999 say that she is half time but you [Dave Dorocz] say that she is only quarter time. Kathy asked if there was some change in the way that this arrangement worked out. Dave explained that she is half time in the sense that she not only supports the Restoration Advisory Board but she supports the Installation Restoration Program. 25% of her time she supports the Restoration Advisory Board another 25% of her time supports the Installation Restoration Program, which includes activities such as maintaining the Admin Record, the Repositories and other activities. Kathy's concern is whether or not the secretary is being siphoned off to do other things and doesn't have the time to do what she needs to do for the RAB. Dave Dorocz feels she is very efficient, produces high quality documents and the 25% is appropriate. John Vitkevich asked if there is something that is not being done for the RAB members. Kathy mentioned that at a prior meeting there was a question about the timeliness of the minutes and was trying to figure out if there was some sort of administrative problem and the secretary didn't have the time to complete them. John has no problem with the receipt of the meeting minutes. Kathy asked if there were any other questions about the budget. Gene Love asked for a detailed budget so that as a RAB member they have a better definition as to how these monies are expended rather than the cursory report that we have been getting. Detailed budget will be provided.

RAB Newsletter-Dave analyzed the process of the creation of the Newsletter. These are the steps of the process-a topic is selected, Claudette asks all members to provide articles, once someone agrees and writes the article(s) it is provided to Claudette. Claudette then turns the article(s) in to the RAB secretary. It then takes 2 weeks to produce an initial draft of the Newsletter, which includes all graphics, pictures, editing, etc. The draft is then sent back to the Public Information Committee. Comments and additional editing are then given back to the RAB secretary. It takes 0-2 weeks to produce a draft final, which is provided to the Public Information Committee. Once the Public Information Committee reviews the draft final it is given back to the RAB secretary to make the final edits if

any. The newsletter is then brought to Defense Automated Printing Service (DAPS) on Naval Station Newport for printing which takes 2-4 weeks. During this 2-4 week period DAPS bids the job, provides a proof which the RAB secretary reviews and returns in one day, prints, folds, labels and return 600 newsletters to the RAB secretary who then mails them out the day they are received from DAPS. It takes 4-12 weeks to produce a newsletter once a topic and articles are provided.

The final draft of the last newsletter went to the Public Information Committee on January 17, 2001. It was received back on February 16, 2001. There were minor edits, which took from the 16th of February to the 27th of February. The newsletter went to DAPS on February 27, 2001 and was returned fully printed on March 16, 2001 when it was mailed out. It is critical for the Public Information Committee to be able to turn the document reviews over in less than a week.

Base Passes-RAB members can obtain one year base passes to Naval Station Newport. Members must go to the Pass Office located at Gate 1 and identify themselves as RAB members. Members need to provide their driver's license, registration and proof of insurance.

RAB Training-The Navy is sponsoring RAB training for the Navy Chair and Community Chair in Denver, CO in May. Barbara is unable to attend and has asked Kathy Abbass to attend on her behalf. Kathy thanks everyone for sending her to Denver. This is a chance to share with other RABs what we have done here and also to learn from other RABs what works for them. Kathy would like the agenda for this training provided to the RAB so that it can be looked at and discussed at the April meeting. She is looking for messages or instructions the members would like her to take to this group or things she should keep an eye on specifically. The agenda is provided as enclosure (4).

McAllister Point-The Point of Contact (POC) on the McAllister Point project for any items of concern with how the project is proceeding is Robert Krivinskas 841-1761. Mr. Krivinskas is with the Resident Officer in Charge of Construction (ROICC) here at Naval Station Newport. This is Northern Division's satellite construction office. If resolution cannot be reached with Mr. Krivinskas please contact Captain Cooper at 841-3715.

There was a question concerning truck traffic, which was previously answered in questions 3 & 4 that the Navy had provided. Truck traffic on this project will not begin before 8:00 am. One driver showed up at 7:45 am and was severely

reprimanded and put on notice. Issue was also brought up about the trucks driving safely through the residential areas of Greene Lane. All drivers are going to be given a firm safe driving directive.

Emmet Turley asked where the staging area is for the trucks before 8:00 am. Dave Dorocz stated the trucks will have to find a staging area somewhere. This is outside of the control of the Navy.

NEXT MEETING

The next meeting of the Restoration Advisory Board (RAB) is scheduled for Wednesday, **April 18, 2001**, at 7 p.m., at the Officers' Club. The agenda will include an activity update. The RAB subcommittees will meet independently with their respective members after the activity update.

Enclosures:

- (1) Kathy Abbass' Addition to Previous Minutes
- (2) Activity Update
- (3) Planning Committee Report
- (4) RAB training agenda

SUPPLEMENTARY REPORT ON McALLISTER POINT DREDGING PROJECT

The minutes of the February 21, 2001 meeting indicate that I gave a presentation on a November meeting between RAB members and the engineering staff of the McAllister Point project. Unfortunately, my remarks are not summarized and only Jim Shafer's responses are attached as Enclosure (4).

The following remarks are extra information that I presented but that Jim did not address:

Question: Why do we have to dredge the whole offshore area of McAllister if there are only limited "hot spots" of toxic materials?

Answer: The EPA requires that the trash be removed, as well as the toxic materials. It was specifically stated that most of the trash had to be removed ONLY because it was in the marine environment. The engineers also stated that if such trash were in our backyards, we would not have to remove it. So it is a federal mandate over which the Navy has no control.

Question: Why can't they bring in barges to remove the material instead of building an access road, trucking it to the Tank Farm for processing, and the trucking it out Green Lane?

Answer: The area is too shallow for barges. I don't believe this, but will accept their answer.

Question: What will be done about the odors coming from the Tank Farm as the material is processed.

Answer: They stated that the odors will be minimal. I don't believe this, and suggest that the public be vigilant.

Question: What grievance process is in place in case the trucks don't follow required guidelines for travelling through residential areas.

Answer: Individuals may call the Capt. at the base or the Senior Engineer of the project. Note: This needs to be clarified.

ENCLOSURE (1)

Activity Update

Naval Station Newport
Installation Restoration Program

Old Firefighting Training Area

- Final offshore ERA submitted April 28, 2000
- Final onshore Background study in Aug 2000
- Draft Final Remedial Investigation Report for onshore and offshore submitted Oct 25, 2000
 - final RI report submission pending resolution of outstanding issues for offshore PRG's
- Feasibility study planned for April 2001

ENCLOSURE (2)

McAllister Point Landfill - Offshore

- Record of Decision -USEPA signed 3/1/00
- Notice of availability of ROD
- Deadlines for Remedial Design Documents
 - 35% Remedial Design Workplan 1May 00
 - 60% Remedial Design Workplan 20 July 00
 - 85% Remedial Design Workplan 10 Oct 00
 - Final Remedial Design Workplan 4 Jan 01
 - Pre-Construction Meeting 26 Feb 01
 - Project Closeout Report 30 Aug 02

McAllister Point Landfill - Onshore

- Continue long term monitoring of landfill gas and groundwater

Tank Farm 5

- One additional sampling of all wells required to support final decision
- Sampling planned for late May/early June
- Round 4 consist of sampling all 17 existing monitoring wells and 2 extraction wells

Derecktor Shipyard

Onshore:

- Submitted removal action report September 2000
- Planned submission revised report March 31 2001

Offshore:

- Funding for remediation planned for 2005/2006

Melville North Landfill

- Remediation Complete
- Submitted Closure Report September 2000
- Received RIDEM comments Jan 16, 2001
- Submitted revised report March 6, 2001

Gould Island

- Submitted final SASE Report December 2000 recommending proceed to RI/FS
- RI field work planned for 2003

RESTORATION ADVISORY BOARD

Project Committee Report
"Providence River Dredging Concerns"
March 21, 2001

This month I have submitted two articles which address concerns about the Providence River Dredging Proposal.

The first, by Dr. Dennis Nixon, Professor, Dept. Of Marine Affairs, U.R.I. addresses the fact that two major dredging proposals which will impact Narragansett Bay, have and are being addressed independent of their impacts on the valuable uses of Narragansett Bay.

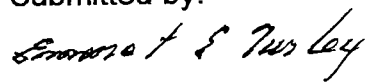
Dr. Nixon discusses the existing uses of the Bay by four industries-fishing, recreational boating, coastal tourism, and marine transportation. He goes on to explain the economic and environmental effects of each venture.

Further, he notes that the debate about dredging the Providence River Channel has been overshadowed by the state's proposal to build a container port at Quonset. Any decision, he feels, should be determined by a study of Bay uses/development issues with a well-researched and integrated plan.

His solution-use the resources of the U.R.I. Coastal Institute on the Narragansett Bay campus as a means to do the research, address the problems, and develop sound policy alternatives that will protect the Bay.

The second article, much longer and in greater depth, is an extremely informed presentation of this plan-the "Executive Summary" of the Narragansett Bay Summit 2000.

Submitted by:



Emmet E. Turley

ENCLOSURE (3)

Science Before Policy: The Case for a Narragansett Bay Use Plan

Dennis Nixon, Professor
Department of Marine Affairs

Dennis Nixon earned a BA in history from Xavier University, a JD from the University of Cincinnati, and a Master of Marine Affairs from URI. As a professor of Marine Affairs, he teaches courses in fisheries, admiralty, and coastal zone law. Nixon is also legal counsel for the University National Oceanographic Laboratory System (UNOLS), where he advises the National Science Foundation, the Office of Naval Research, and the National Oceanic and Atmospheric Administration on marine law and insurance issues.

One of the basic tenets of good governance is that policy choices should be illuminated by sound science. Despite the fundamental logic behind informed decision making, such an approach has not yet been undertaken for Rhode Island's most precious resource, Narragansett Bay. Although the Narragansett Bay Summit 2000 highlighted many of the issues that impact the health of the Bay, it all but ignored two of the most important policy issues that have been publicly debated over the past several years: the proposed dredging of the Providence River to maintain the channel to the Port of Providence and the development of a container port at Quonset Point/Davisville. Both projects have been considered independent of their impacts on the other valuable uses of the Bay. It's a little like two members of a family undertaking major home renovations without consulting each other.

Choices must be made, but they should be based upon the best scientific information that is available. Narragansett Bay is one of the most extensively studied bodies of water on this planet, and yet there has been little use of that data in the controversy over the two proposals. A Narragansett Bay Use Plan would identify all the constituencies that have an interest in the Bay, evaluate their environmental and economic impacts, and recommend policies that minimize the potential for conflict. The plan would also identify the areas where further research is needed. Just who are the constituencies who have a stake in a Bay use plan? At least four major industries will have to be represented: fishing, recreational boating, coastal tourism, and marine transportation.

What questions need to be asked about the existing uses of the Bay? The fishing industry is one of the most complex to analyze. The term "industry" embraces both recreational and commercial fisheries interests. Recreational fishermen dwarf commercial interests in number and influence. Many advocate the abolition of net fishing in Narragansett Bay, similar to a ban introduced in Florida several years ago. They argue that bottom trawling destroys Bay habitat; commercial fishermen respond that this is simply an allocation issue in which they are outnumbered. The Rhode Island General Assembly recently instituted a moratorium on new commercial fishing licenses and has given the Rhode Island Marine Fisheries Council a year to create a more effective license and regulation program. Many traditional finfish populations are at record lows, but it is difficult to ascertain if the cause is overfishing, habitat destruction, pollution, natural variation, or some combination of these factors. The lobster industry is under pressure to reduce the number of traps in the water, increase the minimum catch size, and prepare for the potential advance of the mysterious shell disease that had a catastrophic effect on the lobster fishery in western Long Island Sound last year. The number of quahog diggers has declined, and they face increasing competition from an aquaculture industry that is expanding and in search of new sites. The finfish, lobster, and quahog fisheries and the recreational fishing industry will be directly affected by either of the two port plans now being discussed.

The recreational boating industry encompasses diverse manufacturers, retailers, marinas, and yacht clubs that depend on good water quality, easy public access, and freedom from conflicting navigational uses. Since the Bay was designated a federal no-discharge zone several years ago, the pollution from recreational vessels is caused primarily by toxic bottom paints, fueling accidents, and the discharge of unburned oil from two-cycle engines. Marinas are often located in shallow coves and estuaries that require maintenance dredging. Without an approved marine disposal site, marinas are or will soon be shallower and their capacity to accommodate boats will be reduced. The state's tradition of outstanding yacht design

and construction, developed by the Herreshoff yard in Bristol, is maintained today by companies such as Hall, Hood, Goetz, Alden, and New England Boat Works. While these companies have helped to preserve Rhode Island's reputation as a center of excellence for large yachts, small boat manufacturers have prospered as well. Recreational boaters often transport their Lasers, Sunfish, and other small boats with cartop carriers and trailers to the Bay. These boaters need a place to launch their vessels and water clean enough to make the experience safe and enjoyable. There has not been a recent economic analysis of the recreational boating industry. A detailed look could result in a decision to invest more heavily in this area, with both financial support from the state and preferred status for recreational boaters when conflicts occur with other user groups.

The coastal tourism industry is another significant yet hard-to-measure user of the Bay. Everyone in South County is well aware of the perils of beach traffic when Routes 1 and 1A turn into parking lots. What is more difficult to determine is how important the beaches are to Rhode Islanders and residents of nearby states. How much is spent in coastal communities because of the perceived quality of Bay waters? How dependent is the real estate industry on water access and water views for high prices? Other states have witnessed major conflicts when the "view-scape" of a coastal property owner is disturbed. For example, salmon aquaculture in Maine has raised the ire of summer colonists who dislike the view of the netpens floating in front of their homes. In South Carolina, coastal residents have objected to the high-intensity lighting used at a container terminal near Charleston. When does mere irritation become a measurable impact on property values? What is the cost to coastal tourism revenues of lost opportunities? Both Providence and East Providence have recently outlined plans to revitalize their urban waterfronts, but they must also address the need to relocate the existing oil terminals. In addition, most old industrial sites have significant soil contamination problems that will have to be analyzed and addressed before redevelopment can occur. That research should be undertaken as soon as possible.

Finally, the marine transportation industry is one of the least understood and yet one of the most vital users of Narragansett Bay. Refined petroleum products account for most of the volume and value of the cargo. Four oil terminals in Providence and East Providence supply virtually all of the gasoline and fuel oil used in the state. Because the Port of Providence is located in a river channel with a high rate of sediment deposition, it requires dredging on a relatively frequent basis to keep the channel deep enough for large vessels to use. Since the river drains an area historically occupied by polluting industries, much of the sediment is contaminated. An early proposal to place those materials in a "borrow pit" off East Providence was met with fierce opposition by that city's government; they feared that the contaminated materials deposited in the pit, even if capped with clean fill, would affect their coastal water quality. A companion proposal to dump the relatively clean remaining materials in a deep hole adjacent to Hog Island was met with similar hostility from local governments and the fishing industry. Dumping the material on shore has been rejected as too costly and potentially dangerous to groundwater. The only remaining alternative is to dump further offshore, which is more expensive and certain to be resisted by both recreational and commercial fishermen. Should the existing channel be dredged at all? Most of the oil that enters the port today arrives in barges in coastwise transport from mid-Atlantic refineries. How long will the channel be safe for tugs and barges? Could a smaller dredging project keep the port operational while another long-term, solution is sought?

The debate over the Providence River channel has been eclipsed in recent years by the state's proposal to build a container port at Quonset/Davisville. The reason to build a port there is simple: The United States government built a great facility when it filled hundreds of acres of the Bay to build a port and airfield. As the new owner, the state of Rhode Island should continue those uses and combine them with a mix of activities that maximizes the property's value. Unfortunately, the first development proposal seriously entertained by the state was enormously controversial, largely because it proposed filling more than 500 acres of the Bay to create space for the new terminal. Opposition to the plan was strong and well organized. It raised important issues relating to the transportation infrastructure needed for the project and questioned most of the promises of jobs and economic growth made by the proponents.

Recently, a "Quonset II" container port proposal was presented, with more realistic projections of costs

and benefits for a smaller facility. Still focused on containers alone, "Quonset Lite" would require filling between 38 and 114 acres of the Bay to create a terminal of about 170 acres. The state now recognizes that it will probably need to finance the environmental permitting and at least part of the dredging of the Quonset channel. Fortunately, it appears that the dredge material would be relatively clean and could be used beneficially, for construction aggregate and beach nourishment. The Rhode Island Economic Development Corporation has hired a consultant to develop a strategic plan for all of Quonset/Davisville, including the port, which should be completed in 2001. Should that plan also include an oil import facility in case Providence and East Providence decide to redevelop their urban waterfronts? Shouldn't the oil industry become more involved in such a plan?

That brings us back to the need for a study of all Bay use/development issues, since virtually all the existing and proposed uses impact each other. Only a well-researched and integrated plan can avoid the political controversy and permit paralysis that has characterized the proposed Providence River dredging and the first generation Quonset megaport. Governor Almond has indicated that he will support a Bay development plan as long as it's developed simultaneously with the Quonset/Davisville master plan now underway. Save the Bay, the state's largest environmental group, has demonstrated its strong support for such an initiative on several occasions. How and where could a project like this be completed? The URI Coastal Institute on the Narragansett Bay Campus is now operational and is perfectly situated as a neutral forum to research, discuss, and debate these issues during the next year. Initially funded by a publicly supported bond issue, the Coastal Institute is a resource whose mission is to bridge the gap between university research and the problems of the "real world." Without a political axe to grind, and inclusive in its approach, the Coastal Institute has picked up where the Bay Summit left off to develop sound policy alternatives based on all we already know about the Bay. Any gaps in information should then receive high research priority from state, federal, and private funding sources. It's an opportunity we shouldn't miss.

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Executive Summary

Commercial marine transportation on Narragansett Bay relies on an infrastructure that consists of two channels and three public ports. The two channels are the Providence River Channel and the Quonset/Davisville channel. Currently, the Port of Providence is more active than the ports of Fall River or Quonset/Davisville. This scenario may change in the future depending on the outcome of two proposed marine infrastructure projects, the maintenance dredging of the Providence River Channel and the development of a container port at Quonset/Davisville.

Like any terrestrial infrastructure, marine infrastructure needs to be maintained. In order to maintain the navigation depth of channels, which are the highways of the marine transportation sector, accumulated sediments must be removed by dredging. Dredged material can be disposed of in many ways. Very little dredging has been done in Rhode Island in the past 20 years due to the absence of any approved state or federal disposal sites.

Today, the majority of the commercial vessels that travel via the channels to the ports in Narragansett Bay are carrying petroleum products. In 1997 for example, 86% of the total cargo tonnage that moved through the bay consisted of petroleum products.

The oil that is delivered is carried mostly by non-self-propelled vessels (barges). This may be in part a result of the limited access of deep draft vessels (over 35 feet of draft) to the Port of Providence due to shoaling of the channel and associated traffic restrictions.

Not all of the vessels are carrying petroleum products. Some are transporting people, either on cruise ships or ferries. The number of cruise ships entering Rhode Island waters (almost exclusively with the port of Newport as a destination) has increased since 1994. There are several ferry services in operation on Narragansett Bay. Recently, there appears to be an increased interest in commuting by ferry as evidenced by the new Providence/Pawtucket and Newport/Providence routes.

The movement of commercial vessels on the Bay is managed by the Northeast Marine Pilots and the Coast Guard. In addition to the physical aids to navigation, technological improvements to the information handling infrastructure are changing the way vessel traffic is managed. New systems such as Universal Automatic Identification Systems are available. Pilots are using Global Positioning Systems (GPS) to navigate large ships through the Bay. A PORTS (Physical Oceanographic Real Time System) which provides real time tide, current and weather data is being installed. These and other technologies will enhance the safety of commercial and recreational vessel traffic.

The economic impact of the marine transportation industry on Narragansett Bay is driven by consumer demand for petroleum products for home and office heating and construction material for roads. Economic benefits include lower costs for oil and gas, employment for individuals and profits to businesses. The cruise ships that come to Narragansett Bay also bring economic benefit as part of the tourist industry.

As part of the analysis of maintenance and/or improvements to the marine transportation infrastructure in Rhode Island, the economic costs and benefits need to be considered. Two aspects of the economic impact of the maintenance dredging of the Providence River Channel are the cost due to losses in the fishing industry as a result of the disposal of the material and the benefit to consumers of cost savings on petroleum products derived from the elimination of the need for lightering.

Any analysis of a marine transportation project would also need to include the environmental costs and benefits. Environmental impacts include the impacts of any associated

dredging and disposal of dredged material, port and terminal operations and the activities of ships. Oil spills which are accidental releases from petroleum carrying vessels, can cause significant environmental damage. There have been two major oil spills in Rhode Island waters, one in 1989 and the other in 1996. Another accidental release from ships which is initially imperceptible but is capable of causing lasting environmental damage is the introduction of nonindigenous invasive marine species.

At this time, the people of the state of Rhode Island are considering two large-scale marine transportation projects which should serve as a catalyst for decision makers to take a comprehensive look at the need for marine infrastructure. Existing regulations, plans and data sources should be integrated and in some cases supplemented to allow for a regional and watershed level management approach.

I. The Marine Infrastructure that Supports Commercial Marine Transportation

Secretary of Transportation Rodney E. Slater has made revitalization of the nation's Marine Transportation System (MTS) a matter of high priority. Recognizing the challenges of increasing use of our waterways, growing world population and demand for goods, and the increasing globalization of the world economy facing the marine portion of the nation's transportation system, Secretary Slater began the MTS initiative. The goal of this initiative is "to ensure that our Nation's waterways, ports and their intermodal connections will meet the needs of the 21st century by providing a safe and environmentally sound world-class system that improves the Nation's global competitiveness and security through improving coordination and cooperation among all stakeholders." (Proceedings of the National Conference on the Marine Transportation System: Waterways, Ports and their Intermodal Connections, Nov 1998)

The physical and information-handling infrastructure that supports our MTS must be maintained and upgraded to respond to changes in vessel design, technology, and trade patterns. (The information-handling infrastructure will be discussed below under vessel traffic management.) The MTS report projects a growth of world trade by at least 200% by the year 2020. In addition, the average vessel size is expected to increase. The U.S. system needs to be accessible to these vessels.

Most vessels travelling through Narragansett Bay are destined for one of the three principal public ports: (1) the Port of Providence; (2) the Port of Fall River; and (3) the Port of Quonset/Davisville. Several smaller, privately-operated facilities also exist in the harbors of the region, mainly for the receipt of refined petroleum products.

There are two channels in Narragansett Bay. One goes to the port of Providence and the second goes to Quonset/Davisville (Figure 1). The Providence River channel is 6.8 miles (27 kilometer) long. It begins near the head of Providence Harbor and follows the river on a southerly course to deep water near Prudence Island (Figure 1). The upper two and one-half miles comprise the Main Harbor. Providence River and Harbor together constitute the principal commercial waterway in Rhode Island.

The Providence River channel is authorized to be maintained at 40 feet below Mean Low Water. However, the shoaling that has occurred since 1976 has resulted in a controlling depth of 30 feet below Mean Low Water. The Coast Guard has also restricted the former two-way traffic to one-way traffic in the upper channel. The channel into Quonset is currently 32-35 feet deep, and into Davisville 28-30 feet deep.

II. Maintenance of Marine Infrastructure: Dredging

1. Introduction

An essential aspect of marine transportation in any enclosed waterway (such as Narragansett Bay) is the need for adequate water depth to permit safe passage of vessels. In most areas of the northeastern United States this requires periodic dredging of shipping channels to a federally-authorized depth. Narragansett Bay has a federal channel, commercial berths at piers and numerous marinas and harbors for small commercial and recreational vessels. If commercial ports are part of the future of the Bay, additional water depth may be required to permit passage of larger vessels.

2. Definition of Dredging

Dredging is the removal of sediments from waterways to maintain navigation depth. As rain washes soil from hillsides, farmland, backyards and city streets, it finds its way through streams and rivers into harbors and Narragansett Bay. Each year the sediment carried into the Bay settles into the channels, berth areas and marinas and decreases the water depth. Some parts of the Bay are naturally scoured or very deep, but many parts of the channel fill in until they reach the level of the surrounding sediment. In most cases the shipping channels have been artificially deepened to permit passage of sailboats and larger vessels (tankers, container ships, bulk cargo ships).

Dredging requires the physical removal of accumulated sediment through the use of dredging equipment. In most cases this involves sending a clamshell bucket to the Bay floor and lifting a mixture of sediment and water into a barge. The barge is towed to a location where the dredged material can be safely placed outside of the channel (another area of the seafloor, on land, or into a diked containment area). In some cases (e.g. breachways), the sediment may be removed with a hydraulic dredge and pumped onto a beach or into a barge.

3. Dredged Material

Dredged material is the mixture of water and sediments such as rock, gravel, sand and mud removed from the Bay floor. It can contain organic material (decomposing plant and animal remains), and material discarded by humans (bottles, shopping carts). Among the materials discarded by humans are contaminants carried in runoff and discharged directly into the Bay (oil, metal wastes, fertilizer).

A determination must be made of the risk to human and ecosystem health associated with the material proposed for dredging. In general dredged materials are classified as Suitable (for unconfined open ocean disposal) or Unsuitable. This determination is made by the U.S. Army Corps of Engineers in consultation with U.S. Environmental Protection Agency based on sediment chemistry and biological effects testing. Unsuitable sediments must be isolated from the marine ecosystem. If they are disposed on land, they must pass regulations for waste disposal and be isolated from groundwater discharge.

While some sediments may have contaminants, these sediments are not sludge, hazardous waste, or spoil. Sludge is an industrial product that collects in settlement tanks or ponds (e.g. sewage, metal processing). Hazardous waste is a classification of materials (liquids, soils,

sediments) that are directly hazardous to human health and they are treated by a different set of procedures and laws. Spoil is an archaic term applied to the materials discarded from mines and dredging operations. It applies to the unregulated dumping of salt-laden sediments or acidic soils on agricultural or marshlands, rendering them "spoiled" for further use.

4. Disposal of dredged materials

The disposal of dredged materials is regulated by state and federal agencies under a number of laws and regulations. Determination of a disposal alternative is made on a project specific basis. There are five broad groupings of disposal options. The five categories and their potential use in Rhode Island are:

- Beneficial Use: If materials are coarse-grained (sand) they may be used for beach nourishment or construction fill. With treatment, remediation of contaminated land areas may be possible. Outside of the coastal ponds, very little of the materials from Narragansett Bay meet these criteria.

- Treatment Technologies: A wide variety of technologies can be used to remove or stabilize the contaminants, organic load, and salt content of the marine sediments. After treatment the by-products might be suitable for construction fill or landfill cover. While promising, these technologies are relatively expensive and most are designed for small-scale application to highly contaminated soils. An exception is if a large-scale process can be developed adjacent to a large-scale infrastructure project. For example, the contaminated sediments from New York Harbor are treated and used to create concrete for use in construction. All treatment technologies require large vacant land areas near the shore to dewater the sediment and process. To date, no available land areas have been identified in Rhode Island.

- Upland disposal: Where land is available (closed landfills, quarries, vacant lots), dewatered sediment can be contained on land behind berms with controls for groundwater contact. This approach requires dewatering sites near the water and truck transportation of materials to the site. Rhode Island has a small number of suitable sites but no identified dewatering capacity at present.

- Aquatic disposal: Dredged materials are barged directly to an aquatic disposal site and placed on the seafloor by opening the barge and letting the materials fall to the bottom. If unsuitable materials are permitted for disposal they are placed on the bottom and covered with a layer of clean material in a process known as capping. This process forms a low mound on the seafloor which can be monitored for impacts (SAIC 1995). Aquatic disposal of suitable sediments is currently being considered by the Army Corps of Engineers (ACOE) for disposal of material from the Providence River Channel.

- Aquatic CAD cells: A new approach involves opening a pit in the channel or harbor (the majority of the material removed from deep in the pit predates the production of contaminants), filling the pit with unsuitable sediments and capping the pit with clean sediments. This approach is called Confined Aquatic Disposal (CAD) in cells. This approach is under consideration for disposal of the unsuitable material from the Providence River Channel dredging project.

5. The need for dredging in Rhode Island

The primary dredging needs in Narragansett Bay and Rhode Island are: the federal navigation channel to Providence currently authorized to be maintained at a depth of 40 feet; harbors within the Bay, private marinas, and the breachways into coastal ponds. There remains the possibility that a deeper channel might be required leading to Quonset Point depending on details of development (container port, carrier museum, industrial park). The federal channel to Providence has not been dredged since 1976 and has shoaled (filled-in) significantly (between 3 and 10 feet of fill, ACOE 1998). Harbors with federal channels that may require dredging include: Block Island, Newport, Wickford, Sakonnet, Warwick Cove, Apponaug, Greenwich Bay, Bullocks Cove, Seekonk, Pawtuxet Cove, Potowomut River, Pt. Judith, Pawcatuck River, Little Narragansett Bay and Watch Hill Cove.

Table 1. Estimated requirements for dredging (as of Year 2000)

	Suitable for unconfined disposal	Unsuitable for unconfined disposal
Federal channel	4.7 million cubic yards*	1.2 million cubic yards
Harbors	2.7 million cubic yards	? unknown breakdown
Marinas and Ports	700,000 cubic yards	600,000 cubic yards
Breachways**	30,000 cubic yards per year	

* includes 1.6 million cyds removed from a confined aquatic disposal cell to permit isolation of unsuitable material

**Breachways and their associated flood tidal deltas will be part of a more extensive (and expensive) habitat restoration project in South County within the next few years. However the breachways need to be maintained on a regular basis and would form an essential part of a dredged material management plan. In most cases the breachway dredging should be able to provide beach nourishment material and serve as a beneficial use.

6. Managing dredging in Rhode

The Coastal Resources Management Council (CRMC) is the lead agency for with the responsibility for managing dredging and disposal in Rhode Island. They are charged with developing a dredged material management plan for the state and designating sites for disposal of clean sediments from marinas and yacht clubs. The Department of Environmental Management conducts Clean Water Act review of permits and ensures that water quality standards are not violated during dredging or disposal. The U.S. Army Corps of Engineers New England District issues permits for dredging and disposal in the Bay and is responsible for maintaining federal navigation channels. The U.S. Environmental Protection Agency (USEPA) reviews permits for dredging and disposal in the Bay and would be the lead agency for designating any offshore disposal sites in Rhode Island Sound. The U.S. Fish and Wildlife Service and the National Marine Fisheries Service reviews permits for dredging and disposal in the in relation to endangered species and fish and wildlife resources.

III. Waterborne Transport: A Description of What Moves on Narragansett Bay

1. Introduction

In this section, our focus is on commercial marine transportation. Hence, fishing boats, pleasure craft, and military vessels will not be discussed. The most readily available shipping data is for the Providence River and Harbor, and our discussion emphasizes this area. We note, however, that vessels periodically visit Quonset Point/Davisville to deliver automobiles and for fish loading, and vessels also pass through the Bay to service Brayton Point and Fall River in Massachusetts. We believe that the information described herein reasonably captures Rhode Island marine transportation activity on Narragansett Bay. Nevertheless, we recognize that our omission of data for Fall River, Brayton Point, and Quonset/Davisville understates total vessel activity on the Bay.

2. Cargo Traffic

An analysis of cargo movements on Narragansett Bay was done. It relies on data supplied by the U.S. Army Corps of Engineers' Waterborne Cargo Statistics. Data for harbor areas provided by the Corps includes the combined traffic at both public and private terminals, and are reported in thousands of short tons (2,000 lbs.)

Review of the data for the Providence River and Harbor suggests several trends:

A. Marine transportation on Narragansett Bay primarily involves delivery of petroleum products, especially gasoline and distillate fuel.

Of the 8,780 thousand metric tons of cargo delivered in 1997, fully 86 % by volume was petroleum or petroleum products (Figure 2). Of these cargoes, 60 % was gasoline and 28 % distillate fuel. Crude materials and primary manufactured products (e.g., cement, chemicals, preformed steel, lumber, asphalt, and bulk salt) made up 13 % of the volume

B. Vessel traffic on the Bay has steadily declined over the past two decades, although cargo tonnage has increased.

The number of inbound and outbound trips in the Providence River and Harbor fell from 5,614 in 1980 to 2,893 in 1997 (Figure 3). With the exception of 1991 – 1993, the decline in vessel traffic has been continuous, with a smoothed rate of decline of about 3 percent from 1980 to 1997. Over the same period, however, cargo movement through the Bay has increased from 7.5 million tons in 1980 to 8.8 million tons in 1997, a smoothed annual increase of about 1 % (Figure 4).

C. Most of the vessels using the Bay are domestic, non-self propelled tankers

In 1997, most of the vessels inbound to Providence River and Harbor were tankers (39 %) and tug and tow vessels (42 %). Most tankers (77 %) were non-self-propelled (i.e., they were barges). Only 5 % were non-self propelled dry cargo vessels. Most inbound vessels are domestic, reflecting the fact that the vast share of petroleum and petroleum product comes from domestic sources, and by law, coastwise shipments must be carried on domestic vessels.

D. Access by deep-draft vessels to the Providence River and Harbor is limited and has diminished with the decrease in depth and width of the federal channel.

Sediment buildup since the last major dredging project in 1976 generally limits access to vessels with a draft of less than 35 feet. In 1988, for example, some 80 vessels with a draft of over 35 feet visited the Providence River and Harbor; in 1997 that number was about 25.

Due to depth limits, deep-draft tankers (up to about 50 feet) must lighter onto smaller vessels before entering the Bay, light load (i.e., carry less than full loads), or await a high tide in order to meet bottom draft limits. Deliveries on deep-draft vessels (>35 feet) have diminished over time, and most vessels now using the Providence River and Harbor have shallow drafts (73 % < 18 feet in 1997).

3. Passenger/Cruise Ship Traffic

Two ports, Newport and Providence, have historically served as ports-of-call to large cruise ships entering Narragansett Bay. Newport is the primary port for cruise ships, since it is a destination site well known for the mansions and other historical sites. In the recent past few ships have visited Providence.

Twenty three different cruise ships greater than 100 dwt (deadweight tons) came to Narragansett Bay from 1992 to 1999. Overall, cruise ship activity has been growing since 1994. In the period under study there were a total of 230 port visits. The depths of water in the channel of lower Narragansett Bay are sufficiently deep to allow all cruise ships in service to enter the Bay, and anchor at Newport. However, if in the future it becomes necessary to accommodate cruise ships at berths constructed at other sites (for example at Providence), then minor dredging might have to be undertaken.

4. Passenger/Ferry Traffic

There are several year-round several ferry services in Rhode Island waters. Such services are provided to Block Island and Connecticut, with several vessels departing from Point Judith. Another service connects Bristol with Hog and Prudence Islands. A ferry service will begin in the summer of 2000 between Providence and Newport. Last year a ferry/ commuter service was inaugurated between Pawtucket and Providence with two 49-passenger ferries, which also provide tour cruises daily in off-peak hours and on weekends.

There are currently three existing water taxi operations on the Bay. A service is provided in the northern reaches of Narragansett Bay, with two boats. Within Newport Harbor, one firm has several water taxis available. And small ferry/water taxi service connects Jamestown with Newport. In addition, next summer, a nonprofit organization hopes to offer service in the Newport Harbor Area.

Many metropolitan areas throughout the United States are experiencing a resurgence in interest in passenger water transportation. Two factors that have accelerated the implementation of ferry plans are the increase in waterfront real estate development in urban areas and the inclusion of obsolete or underutilized maritime transport facilities in development plans. Additionally, highways have become increasingly crowded. The potential for the provision of new ferry services on Narragansett Bay into the 21st century will be dependent on future studies identifying passenger transport demand.

IV. Vessel Traffic Management

All large vessels are required to have a pilot aboard while transiting inland waters such as Narragansett Bay. Vessels that are US flag and are trading between US ports may hire either a federally licensed pilot, or a state licensed pilot. Foreign flag vessels are required to take a RI State licensed pilot in RI waters. Tugs and barges carrying over 1000 gross tons of petroleum are required to take a pilot until the tug operator has completed 12 round trips to the port and back.

When a vessel is scheduled for a port call, the owner (or operator) calls their nearest preferred ship agent, who arranges for the pilot. The Northeast Marine Pilot office in Newport provides the pilots for vessels using Narragansett Bay. As a result of this process, the pilot office is a clearing house for information regarding the arrival & sailing times of vessels in RI waters. (The exception is tug and barges who no longer need a pilot). Due to a limited number of tugs, one way traffic in the Providence River, and other factors (tides, weather, daylight, etc.), the pilot office and the pilots assigned to the vessels, coordinate vessel traffic.

During the five year period from January 1, 1995 through December 31, 1999 there were 4094 vessel movements within Rhode Island waters with a Northeast Pilot aboard. Most of these vessels were ships and a small percentage were barges. Of these, 3057 vessel movements were destined for a Rhode Island port and 1037 for a Massachusetts port.

The state of Rhode Island has recently advanced technological safety by purchasing several Global Positioning System (GPS) capable lap top computers for use by the Northeast Marine Pilots who navigate large ships through the Bay. With these portable computers, the pilots have a highly accurate and reliable indication of their vessel's position in the Bay which reduces the risk of grounding or collision.

The in-water aids to navigation used by the pilots and others to move vessels safely in Narragansett Bay are established and serviced by the Coast Guard Aids to Navigation Team (ANT) which is based in Bristol, Rhode Island, and is a subordinate unit of Coast Guard Group Woods Hole, Massachusetts. ANT Bristol services 282 floating aids and 48 structures, including 13 lighthouses within an area from the Sakonnet River to Watch Hill. The ANT also has secondary responsibility for 140 floating aids to navigation.

Presently there are several new systems being developed under the general term of Universal Automatic Identification Systems (AIS) that could revolutionize the efficient and safe flow of vessel traffic. AIS is a shipborne transponder-based navigation safety system that enables the efficient exchange of data such as name, type, position, course, speed, navigation status, dimensions, or type of cargo among ships and between shore stations and ships. If fully implemented, the AIS could provide detailed, real-time information from any large vessel in the Bay for use by other vessels, port authorities, waterfront terminals, ship agents, government authorities, and ship suppliers.

This year, the state of Rhode Island paid for the installation of a PORTS system (Physical Oceanographic Real Time System) for Narragansett Bay that could provide real-time tide, current, and weather information to all the users of the Bay. At the time of this writing, the system was nearly completely installed, but federal funding for the support of the project had been eliminated from the budget. This funding is needed for the system to be activated.

Despite the recent technological advances in vessel traffic management, there are often conflicts over the use of the Bay that are brought to the attention of the Coast Guard. Several examples are:

- Recreational boats were reported violating the Nautical Rules of the Road by impeding the safe navigation of deep draft vessels that are constrained to the limits of the navigable channel.
- The new Seekonk River commuter passenger ferry created a wake that interfered with the use of the waterway by recreational rowing skulls.
- A request was received by the Coast Guard to permit the establishment of an aquaculture farm in a designated vessel anchorage area that would negate its use as an anchorage.
- Recreational boats anchoring near Jamestown Island were reported to be impinging on the adjacent deep-draft vessel anchorage.

Who has the responsibility to manage and resolve these conflicts? Presently, the Coast Guard and the state have jurisdiction to enforce many safety and environmental regulations for users of the Bay. However, as illustrated in the examples above, many of the conflicts that arise do not involve a violation of law or regulation, thereby placing the issue beyond the scope of state or federal intervention. In many ports, federal, state, or privately supported Harbor Safety Committees have been meeting for many years to address port safety. Rhode Island law, passed in the wake of the North Cape oil spill, called for the creation of the Rhode Island Port and Waterways Safety Committee which would annually "review all aspects of navigation and marine operation in Rhode Island waters and make recommendations for safety improvements." The Committee has yet to be formed and would be a valuable forum for resolving user conflicts.

V. Economic Impact of Marine Transportation

1. Economic benefits of the marine transportation industry

Commercial marine transportation activity on Narragansett Bay rests on the demand by individuals and businesses for gasoline to fuel cars, heating oil for homes and offices, construction materials for roads and buildings, etc. Those who receive petroleum or petroleum products, or who send or receive bulk cargo or finished products on tankers, barges, or cargo ships, use vessels because they are a less costly mode of transport than the next-best alternative, truck or rail.

Many thousands of tons of cargo move on the Bay each year, and marine transportation provides economic benefits to different users. These benefits include:

- lower costs for gasoline, heating oil, and other products used directly or indirectly by Rhode Island residents and businesses
- profits from transportation cost savings received by owners and operators of terminals, wholesalers, local gas stations, and heating oil companies
- payments to the many hundreds of individuals who are employed in the marine transport sector and earn more than they could in their next-best alternative

Currently, private terminals, including Mobil Oil, Sprague Energy Corp., Getty, Northeast Petroleum, Hudson Petroleum, as well as PROVPORT, operate in and around Providence River and Harbor. Several marinas also operate in this area. Overall, in 1995 in Rhode Island some 716 individuals were employed in water transportation activities and earned \$18.66 million in compensation. Businesses in this sector had output valued at \$131.83 million and value added (wages, profits, interest, etc.) of some \$26.72 million. These figures include marinas, which are not considered as commercial marine transportation in this report, and, therefore, somewhat overstate economic activity in the water transportation sector.

The number of cruise passengers visiting the Bay also has an economic impact. Passengers are tourists who spend money on the local economy. This is especially important for the City of Newport, which is highly reliant on tourism dollars.

If the assumption is made that ships were fully occupied, then in the past eight years, approximately 250,000 people (passengers and crew) toured Newport due to cruise ship calls. Based on a conservative estimate, if each person landing at Newport spent \$10.00 (on tours and incidentals), then their spending would have contributed \$2.5 million to the local economy.

Other, less tangible benefits are captured by residents and visitors who annually take many thousands of trips on ferries. The benefit to these passengers the means to reach a destination.

2. Current Marine transportation Issues

Current marine transportation issues include the maintenance dredging for the federal channel and in and around the Providence River and Harbor and disposal of the dredged materials, and the potential development of a new port at Quonset/Davisville.

A. Maintenance Dredging of the Providence River Channel

Maintenance dredging is a recurring issue in the federal channel, at commercial berths, and at local marinas in and around Providence River and Harbor (See Part II).

Key concerns with dredging are the disturbance of contaminated sediments at dredging sites and the consequences of disposal of clean sediments for Bay fisheries. There will be an economic cost of disposal of clean marine sediments from the Providence River Channel.

The US Army Corps of Engineers (ACOE) currently is weighing which of several sites in Narragansett Bay or Rhode Island Sound to use as a marine disposal site for clean sediments (ACOE, Draft Environmental Impact Statement, 1998). Rapid disposal of sediment will suffocate mollusks, lobster, and benthic species (e.g. flounder and scup), and perhaps other species, and will cause short-term and long-run losses both on site and offsite due to loss of adults, young-of-year, and juveniles. Additional losses may occur due to food web effects. Fishery losses will affect commercial and recreational catch and will continue until species recover.

Grigalunas, Opaluch and Luo (1999) (GOL) have estimated the cost to commercial and recreational fisheries of disposal of some 5.1 million cubic yards of clean sediments from dredging the federal channel and berths in and around the Port of Providence. They used a bio-economic framework to estimate losses to fisheries at seven potential disposal sites, three in the Bay and four in Rhode Island Sound. Only losses to fisheries were considered; transportation costs to different disposal sites, and other factors that might influence site selection were not considered.

The fishery losses estimated by GOL include short-term effects, long-term effects, and indirect (food web) effects. To provide conservative (i.e., high) estimates, they use an overstated-cost approach by adopting assumptions that lead to higher estimates whenever judgments had to be made. For example, they assume 100 % mortality to all biota in the affected area during the entire 18-month disposal period.

GOL estimate base-case losses to fisheries of from \$0.39 million to \$2.43 million with costs consistently much higher at potential disposal sites in Narragansett Bay as compared with potential sites in Rhode Island Sound. Recreational losses were found to be substantial, particularly for Bay sites, and indeed at one Bay site, recreational losses exceed commercial losses. Losses to species such as tautog that are heavily harvested by recreational users can be large because they have a

higher marginal value for catch than most commercial prices. Losses in Rhode Island Sound would primarily affect commercial fisheries, notably flounder and lobster.

A series of sensitivity analyses considered how several factors would affect estimated costs. Factors considered include: mortality impacts over a larger area, greater food web effects, and a longer recovery period. These (and other) assumptions result in "worst-case" estimates of costs, ranging from \$0.70 million to \$4.44 million. Again, potential disposal sites in the Bay have larger estimated fishery losses than those in the Sound.

There are also potential economic benefits from dredging the Providence River Channel. Currently, some 150 million gallons of gasoline are lightered each year, according to the ACOE. Lightering is the transfer of oil from a deep-draft tank ship into barges. The lightering site in Rhode Island is North of the Newport Bridge. Lightering involves an extra cost

Considering the costs associated with lightering, if dredging in and around Providence River and Harbor allowed deeper draft vessels to use the Bay and by that, reduced costs by, say, \$0.025 per gallon of oil lightered, then the annual benefit would be on the order of \$3.75 million ($= .025 * 150,000,000$).

Dredging creates savings by decreasing the price to consumers. If consumers do not receive all of these benefits, then some share of the savings becomes a gain to Rhode Island terminal operators and distributors. Benefit from dredging may go to RI consumers, petroleum dealers, or businesses—or be shared among these groups, depending upon the degree of competition in the petroleum market. Benefits continue on into future years until gradual sediment buildup in the channel and at berths once again requires light loading, lightering, and delays due to tides or one-way traffic restrictions.

A more realistic assessment of potential savings to Rhode Island from dredging would take into account the fact that (1) not all of the lightered product is delivered to Rhode Island, (2) dredging of the federal channel may not allow all facilities to accept immediately deeper draft vessels, and (3) the benefits from dredging will erode over time since sediment build up in the channel is a continuous process and sedimentation will start again as soon as the channel is dredged. On the other hand, the \$3.75 million figure mentioned above is an understatement since demand for petroleum products is generally increasing over time. Without dredging, costs to Rhode Island individuals and businesses might grow.

To gain some idea of the potential benefits from dredging, we use a series of simplifying (but not entirely implausible) assumptions. First, we presume that sediment buildup in the federal channel starts as soon as dredging is completed and over time eliminates the benefit from dredging. The time it will take for sediment buildup to reach current levels is not clear (the last maintenance dredging was done in 1976), so we use alternative scenarios that sediment buildup to current levels will take either 15 or 20 years. We further assume that the annual benefits from using deeper draft vessels decline linearly over time as sediment buildup proceeds. For example, for the 20-year case, in year 1 all of the benefits are captured, in year two 95% are realized, year three, 90%, etc, until in year 20 the benefits from maintenance dredging today cease.

Finally, we use two assumptions about growth of oil through the Bay. Our high assumption assumes that petroleum product demand increases annually by 2.6%, the average of the annual growth rates for deliveries to the Port of Providence over the ten year period from 1988-1997.

So, if 150 million gallons are lightered now, in year 1, 153.9 million gallons are lightered, in year 2, 157.9 million gallons are lightered, etc. Our low assumption uses a lower growth rate of 2 % to reflect possible increased substitution of natural gas for oil in the market area.

Table 2 shows the estimated benefits from dredging under the assumptions used.

Table 2: Net Present Value of Cost Savings From Dredging in Providence River and Harbor Under Alternative Assumptions

A: Average annual growth rate 2.6%				
Incremental cost per gallon (\$)		\$0.02	\$0.05	\$0.08
Period (Years): 15 (Million \$)	100%	\$52	\$130	\$208
RI share (Million \$)	50%	\$26	\$65	\$104
	70%	\$36	\$91	\$145
Period (Years): 20 (Million \$)	100%	\$62	\$154	\$247
RI share (Million \$)	50%	\$31	\$77	\$123
	70%	\$43	\$108	\$173

B: Average annual growth rate 2%				
Incremental cost per gallon (\$)		\$0.02	\$0.05	\$0.08
Period (Years): 15 (Million \$)	100%	\$50	\$124	\$199
RI share (Million \$)	50%	\$25	\$62	\$99
	70%	\$35	\$87	\$139
Period (Years): 20 (Million \$)	100%	\$58	\$145	\$233
RI share (Million \$)	50%	\$29	\$73	\$116
	70%	\$41	\$102	\$163

The results show different assumptions about the amount saved per gallon by avoiding lightering (ranging from \$0.02 to \$0.08 per gallon). To estimate how Rhode Island individuals and businesses would benefit, the results present cases where Rhode Islanders are assumed to get either (1) 50% or (2) 75 % of the lightered oil.

For example, if benefits from dredging last for 15 years (declining each year due to sediment buildup, as noted), if the savings per gallon is \$0.02, and if Rhode Island receives only 50 % of the lightered oil, then the estimated present value of benefits amount to \$23 million. Benefits are higher in the other cases. These dollar values are the present value of the annual savings estimated using the above assumptions and a discount rate of 6.87%, the rate used by the ACOE for this project. Clearly, this area warrants much more careful research to pin down these benefits than is possible in this modest document. An assessment of the *net* benefits to Rhode Island, of course, would have to include any incremental costs borne by the State and any incremental environmental costs that result (for example, any damages if lightering leads to an increase in oil spill).

At present there are also costs associated with the delay of some vessels due to waiting for high tides, restriction of traffic to one way at a time and light loading. Clearly, there needs to be a

careful study of the economic costs and benefits of dredging the Providence River Channel and nearby berths.

B. Potential Port at Quonset/Davisville

A second important potential development concerns possible construction of a port at Quonset Point/Davisville. Such a port could be designed to handle the growing number of containers expected to arrive on the East Coast in the near future and/or complement current activity at the Port of Providence.

Rapid growth in use of containers, the expansion of port activity in Southeast Asia and South Central Asia (India and Bangladesh), and technological advances favoring the use of larger container ships, are changing the structure of the container shipping industry. One result is an increase in demand for container port services along the US Atlantic Coast to accommodate more and larger container ships to serve regional and Mid-West markets.

A recent proposal for a large-scale, privately financed container hub port, advanced by the Quonset Point Partners, was rejected by the Economic Development Corporation due to the inability of the proposed developers to secure firm commitments from shipping companies to use the port. Nevertheless, the presence of land, rail, and road access to facilities in relatively close proximity to open water makes the area potentially attractive as a port.

Development of any new port at Quonset-Davisville will depend upon what type of port is envisioned, the products to be handled, and site-specific factors. Key concerns raised during a recent stakeholder process included: financial feasibility, net benefits to the state (who gains, who pays and how much), marine and terrestrial environmental issues and social issues. All of these concerns have an associated economic cost.

VI Environmental Impacts of Marine Transportation and Dredging

1. Marine Transportation

When considering the impacts of shipping on the Bay, one must take into account both the impacts of port and terminal operations and the activities of the ships themselves. Projecting the future environmental risks associated with increased shipping requires an analysis of historical marine pollution and vessel accident data. Using this information, it is possible to attempt to forecast future shipping-related risks based on the expected increase in vessel traffic. By identifying these issues early and taking a precautionary approach, we can manage marine pollution risks more effectively.

Vessel-related marine environmental impacts can be divided into three areas: port operations, accidental releases from vessels, and operational releases from vessels. The following table summarizes the vessel activities, pollutants, environmental impacts, and identifies the responsible regulatory authority:

Table 3: Vessel-related Marine Environmental Problems			
Activity	Pollutant(s)	Environmental Impact	Regulatory Authority
I. Port Operations			EPA, USCG,

1) Shoreline & channel modification	Physical alteration of coastal and marine environment	Habitat loss; degraded water quality; disruption of coastal and benthic ecosystems	USFWS ACOE, CRM DEM
2) Ship repair and maintenance; surface preparation and painting	Heavy metals, particulate and VOCs,	Acute and chronic water, sediment and air contamination	EPA, DEM, CSHA
II. Operational			
1) Transfer of cargo; bunkering; discharge of ballast water; bilge water, tank cleaning residues, cooling system water, solid waste disposal	Petroleum hydrocarbons, solid waste, toxic chemicals and wastewater	Chronic water and sediment pollution; contamination of marine organisms Impairment of commercial and recreational use of marine waters	IMO, USCG, EPA, DEM
2) Receiving and discharging ballast water	Introduction of Nonindigenous Species	Ecological degradation from invasive species colonization	IMO, USCG, EPA, DOI RIDEM
3) Treatment of hulls, submerged parts and pier structures with antifouling coatings	Antifouling Paints containing TBT (tributyltin)	Mutagenesis in non-target species; toxic accumulation in marine sediments and surrounding water	IMO, EPA, RIDEM
4) Burning of fossil fuels	Contribution of SO _x and NO _x to the atmosphere	Air Pollution	IMO, EPA, RIDEM
5) Transferring bulk petroleum products (tank vessels)	Contribution of volatile organic compound (VOCs) to the atmosphere Release of toxic compound into the atmosphere	Air Pollution	EPA, RIDEM USCG
6) Burning of solid waste and hazardous	Cargo spills	Hyper-toxicity of water and sediments; fish and wildlife	IMO, USCG, EPA, RIDEM

substances		kill	DOI, NOAA, JEM
III. <u>Accidental</u>		Impairment of commercial and recreational use of marine waters	EPA, RIDEM
1) Physical accidents involving vessel(s)			

(Source/Data: Thesis of Jeffrey Nield, Brown University Department of Environmental Studies, 1999)

Of all these types of pollution, oil spills have received the most attention. The 1989 World Prodigy oil spill released 392,724 gallons into Rhode Island Sound off Newport; in 1996, the barge North Cape ran aground on Moonstone Beach in South Kingstown, releasing 828,469 gallons. Between 1985 and 1996, the US Coast Guard reported 616 marine pollution incidents in Narragansett Bay overall. Of these, 406 reports included oil spill data. They are shown in Table 4. The total reported volume of cargo spilled during that time period was approximately 1,229,617 gallons. It is clear when looking at this total that the 2 major oil spills account for the vast majority of total reported spills. While the environmental damage from the 2 major spills are well-documented, the cumulative impacts of operational spills on the Narragansett Bay ecosystem are poorly understood.

Table 4 Yearly Summary of Actual Reported Oil Spills involving Marine Vessels, Narragansett Bay, 1985-1996				
Year	Number of Spills (All Vessels)	Number of Spills (Commercial Vessels)	Reported Number of Gallons Spilled	Reported Number of Gallons Recovered
1985	5	1	58	-
1986	56	13	4,508	984
1987	32	5	575	75
1988	27	7	318	48
1989	41	9	392,724	109,093
1990	54	6	491	148
1991	21	3	166	38
1992	44	7	410	126
1993	42	11	757	350
1994	27	4	386	27
1995	27	4	755	355
1996	30	8	828,469	65
TOTAL	406	78	1,229,617	111,309
Source: USCG. 1985-1996. MSMS.				

To explore this issue further, a preliminary statistical analysis was done using USCG oil spill data for the period 1980 to 1997. The objective was to get some idea of factors that explain the number of annual spills.

The preliminary statistical results suggest that the number of spills increases with as the number of trips by vessels of any type increases. However, self-propelled tankers are more likely to spill oil than other vessels.

Specifically, the preliminary statistical results suggest that on average, *one minor oil spill* would be expected in the Bay:

- for every 227 self-propelled tanker trips
- for every 256 non-self propelled dry cargo vessel trips, and
- for every 666 barge trips.

These results are suggestive—not conclusive—as this was a very simplified and preliminary analysis using only readily available data. Clearly, oil spills are complicated issues, involving several factors beyond the scope of this modest effort (e.g. age and condition of vessel, weather, depth, domestic versus foreign flag, etc.) and a careful analysis requires a much more substantial research effort. It should also be noted that spills from vessels each year contribute far less hydrocarbons to the Bay than does runoff from urban areas.

Also, it should be noted that road and rail alternatives to movement of petroleum products by barge and ship impose environmental costs in the form of road congestion, safety, air pollution and noise.

Another accidental release from vessels is the accidental introduction of non-indigenous, invasive species of plants and animals. This has been the subject of international regulation and concern in recent years. While a number of non-native species are known to have proliferated in Narragansett Bay in the 20th century, it is extremely difficult to trace their origins, much less eradicate them. If Rhode Island experiences a major increase in commercial vessel traffic, the introduction of exotic species may be accelerated. An example of a recently introduced species to the Bay is the Japanese Shore Crab. As with many introduced species which often lack predators or competitors in their new environment, this species may outcompete native species for food and habitat. Other ecosystems have experienced major changes due to introduced species. One example is the well documented invasion of the Great Lakes by the zebra mussel. Again, more stringent regulations and a comprehensive management strategy on state, national and international levels will be key to reducing these risks, though they cannot be eliminated.

Other operational impacts of ports and shipping include toxic releases, such as paints, and chemicals, that can accumulate in marine sediments surrounding the port facilities and ship channel. Sediment analyses reveal that historical commercial port areas and dredged channels typically have higher levels of toxic pollutants than other areas of the Bay. Suspension of these sediments from ship operations contributes to the degradation of marine habitat in and around port facilities and dredged channels. However, only in a few limited areas of the Bay is toxic sediment contamination considered limiting to the types of marine animals living there.

There are also environmental risks associated with lightering. To date, there have been no major oil spills attributed to lightering in Narragansett Bay, and very few minor spills. While there is certainly a risk of oil spills each time cargo is transferred, lightering is considered to be a relatively safe practice.

The environmental risks of lightering activities verses the risks associated with large tank and cargo vessels should be carefully analyzed as part of any plan to develop marine infrastructure.

2. Environmental Impacts of Dredging

The dredging activities that may be required in Narragansett Bay in the future have the potential to cause environmental impacts both from the dredging itself and the disposal of dredged material.

Dredging generally has a short-term impact on Bay habitats and resources. The areas that are dredged lie at the bottom of channels and harbors and tend to collect finer-grained sediments (except for coastal ponds). These habitats tend to experience high sedimentation rates and some level of disturbance from passing vessels. However, the disturbance of these sediments can cause a localized increase in suspended sediment (turbidity), the redistribution of fine sediments to other habitats and disturbance of spawning populations (winter flounder, tautog, shellfish). The extent of turbidity is determined by the method of dredging, the ambient currents and the grain size of the sediments. Monitoring studies in Boston Harbor around dredging activities have shown that turbidity increases are about the scale of disturbance caused by ship traffic or coastal storms (2-3 times ambient in a 300m diameter area) and return to ambient conditions within hours after cessation of dredging.

The regulation of dredging requires that state water quality criteria (for contaminants in the water) are not violated during dredging and operations can be suspended if water quality conditions are exceeded. Seasonal restrictions limit dredging periods to avoid known conflicts with spawning populations. On the positive side, dredging in harbors often removes significant amounts of contaminated sediments from high population centers. While the channel often comprises a small fraction of the harbor floor, it tends to act as a sink for fine sediments washed into the harbor. Repeated dredging of the channel could serve to remove a sizeable portion of the most contaminated sediments from urban areas. There is some concern that deepening channels that are presently relatively shallow (e.g. Quonset Point) could change tidal circulation patterns and affect either water quality (low dissolved oxygen) or spawning activities. At present there is no evidence to support this concern, but it will require more extensive investigation.

Disturbance of Bay sediments necessarily disrupts habitats (most sediment types have distinctive communities of animals and in some cases plants). While the channel floors are generally considered a disturbed habitat (due to sedimentation and resuspension from ship traffic) the dredging will remove any existing shellfish (quahogs and lobsters) and alter the habitat for several years. After dredging has ended, the recolonization of the disturbed seafloor (by small worms, lobsters and shellfish) can occur quickly, but is not likely to return to ambient conditions for six months to two years.

The disposal of dredged materials has quite different effects than the removal by dredging, primarily because the dredging requires removing a small thickness of sediment over a large area, whereas disposal is usually confined to a relatively small area.

Aquatic disposal results in short term disturbance of the aquatic site (burial of all slow-moving animals); potential long term change in habitat (if the material significantly changes depth or sediment type; temporary loss of use by wildlife (feeding may be disrupted), disturbance of spawning populations (if disposal occurs during spawning season). Studies of disposal of dredged material at Connimicut Point from Bullocks Cove concluded that there were no long-term irreversible impacts. The habitat recovered within 2 years and appeared stable (ACOE 1997). Similar conclusions were made in monitoring studies of disposal of dredged material at the Brenton Reef disposal site and at Long Island Sound disposal sites (SAIC 1995). Upland disposal can also result in a change in habitat, potential groundwater discharge impacts (these must be controlled to

A dredged material management plan should be developed which would include both existing and future dredged material disposal needs. Maintenance dredging projects such as the Providence River Channel need to be analyzed to determine whether there is a need for the project. Any future shipping and port development plans and the associated dredging need to consider resource allocation and environmental management strategies.

Such a plan should include a Bay-wide plan for managing sediment influx into the Bay, identification of dredging needs, long-term disposal alternatives and a monitoring plan. The plan would need to make beneficial use of dredged materials a high priority and examine historical disposal sites and potential future disposal sites. The current regulatory process needs to be examined to insure that it works in conjunction with a dredged material management plan.

For the State of Rhode Island to effectively manage vessel traffic and pollution risks from commercial shipping and ports, we must have a comprehensive marine infrastructure planning and management strategy in place. Simple technological approaches such as the various Vessel Traffic Control Systems (VTS) used by other commercial waterways would offer some added margin of safety. These systems, similar in some ways to air traffic control, keep track of vessel movements in the Bay at a central facility using real-time information.

Rhode Island law, passed in the wake of the North Cape oil spill, called for the creation of the Rhode Island Port and Waterways Safety Committee which would annually "review all aspects of navigation and marine operation in Rhode Island waters and make recommendations for safety improvements." The Committee has yet to be formed and would be a valuable forum for resolving use conflicts.

In order to develop a plan to deal with the invasion of non-indigenous species, a scientific survey needs to be conducted to analyze the current presence and distribution of any invasive species.

VIII. References

SAIC 1995. Sediment Capping of Subaqueous Dredged Material Disposal Mounds: An Overview of the New England Experience 1979-1993. DAMOS Contribution 95, SAIC Report No. SAIC-90/7573&C84. U.S. Army Corps of Engineers, New England Division, Waltham, MA.

Army Corps of Engineers, 1997. Benthic invertebrates at a Nearshore Disposal Site in Narragansett Bay (Providence River) and Post-Disposal Recovery. Prepared by J. Mackay, New England District, Concord, MA.

Army Corps of Engineers, 1998. Providence River and Harbor Maintenance Dredging Project. Draft Environmental Impact Statement, U.S. Army Corps of Engineers, New England District, Concord, MA.

Grigalunas, Thomas A. James J. Opaluch and Meifeng Luo (1999), Commercial and Recreational Fishery Losses Due to Disposal of Sediments from the Providence River. Concord, MA: US Army Corps of Engineers.

obtain a permit) and temporary loss of use by wildlife. Treatment alternatives require location of facilities for the treatment (dewatering, processing) and disposal of sidestreams (contaminants, bulk treated sediments, wastewater and/or gas).

3. Current issues

Presently, the State of Rhode Island is considering two major marine infrastructure projects: The Providence River and Harbor Maintenance Dredging Project, and the proposed dredging and filling associated with development of deep-water port facilities at Quonset Point/Davisville in North Kingstown. Each of these projects are expected to significantly increase commercial vessel traffic in Narragansett Bay. If implemented together, a restored Providence River channel and a major port facility at Quonset would result in an increase in tanker and container vessel traffic over roughly a 25-year period.

If commercial vessel traffic grows as projected, it will increase the risk of environmental impacts due to accidental and operational spills, introduction of non-native species to the Bay, and other associated impacts. The process of dredging, dredged material disposal, and filling of tidal waters may have the most significant impacts to the Bay of all the marine transportation-related activities discussed above. Comprehensive marine infrastructure planning and improved vessel traffic management systems are essential to reducing these risks.

VII. Management Strategies

As discussed above, there are currently two large marine infrastructure projects under consideration in Rhode Island.

One project is the maintenance dredging of the Providence River Channel to return it to the authorized configuration of 40 feet below Mean Low Water and a two-way traffic pattern. The regulatory process to permit this project has been underway since 1996 and is expected to be completed by 2001. A draft Environmental Impact Statement has been prepared by the ACOE with input from other federal, state and local groups including the general public.

The other project is the possible construction of a container port at Quonset Point/Davisville. To date, a stakeholder process has been undertaken from which certain development principles were agreed to by the majority of the participants. No applications for the development of the project have been submitted to any state or federal agencies.

These projects highlight the importance of carefully considering and planning for any marine infrastructure project.

A process should be put in place to integrate existing regulations and plans that pertain to the Bay. A regional and watershed level management approach should be taken to assess the economic, environmental and social impacts of any project. The need for maintenance and/or creation of deep water channels and development of cargo and petroleum port facilities should be considered.

As a part of a comprehensive planning process, several areas have been identified in this paper that need to be addressed.

In terms of the cruise ship and ferry traffic on Narragansett Bay, in order to fully take advantage of passenger movement through the ports, there will need to be efficient people/luggage transportation linking the airport and rail terminals to the marine port. For example, future travelers could purchase one ticket that will include air, ground, and ferry transportation to a destination such as Block Island.



DEPARTMENT OF THE NAVY RAB TRAINING WORKSHOP



18-20 May 2001

Denver Marriott Tech Center · Denver, Colorado

Friday, May 18

10:00am

Registration

1:00pm – 1:30pm

Opening Plenary and Keynote Speaker

1:30pm – 3:00pm

Washington Perspective Panel

- Navy Budget and Funding Priorities
- Navy Business Processes
- Future Initiatives
- Q&A

3:15pm – 5:15pm

- Risk Communication Training

6:30pm – 7:30pm

Reception

Saturday, May 19

8:00am – 10:00am

and

10:15am – 12:15pm

- Risk Assessment (Human Health/Eco/Background)
- Remediation Technologies
- Site Closeout (LUCs, LTM, and LUCIS)

12:15pm – 1:30pm

Lunch Break

1:30pm – 2:30pm

and 2:30pm – 3:30pm

- Natural Resource Injury vs. Damages

1:30pm – 2:30pm

- Understanding RABs

2:30pm – 3:30pm

- Site Investigations

ENCLOSURE (4)

3:45pm – 4:45pm

General Session – Program Evaluation and Debrief

4:45pm – 5:00

Closing Plenary

Sunday, May 20

9:00am – 10:00pm

UXO and other Technology Issues

10:00am – 12:00pm

RAB Operations Information Sharing (Facilitated Discussion)

12:00pm

Meeting Adjourns